(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization International Bureau



HER THE REPORT OF COLUMN AND THE FIRST HER THE STATE OF THE

(43) International Publication Date 9 September 2005 (09.09.2005)

PCT

(10) International Publication Number WO 2005/082589 A1

(51) International Patent Classification⁷:

B29B 9/10

(21) International Application Number:

PCT/US2005/005617

(22) International Filing Date: 23 February 2005 (23.02.2005)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

60/546,937

24 February 2004 (24.02.2004) US

(71) Applicant (for all designated States except US): LUNA INNOVATIONS INCORPORATED [US/US]; 2851 Commerce Street, P.O. Box 11704, Blacksburg, VA 24062 (US).

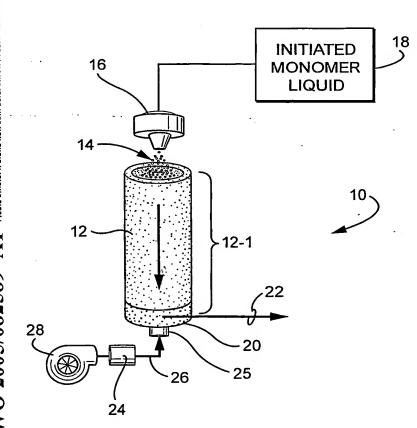
(72) Inventors; and

(75) Inventors/Applicants (for US only): ROGERS, Martin, E. [US/US]; 1222 Village Way, South, Blacksburg, VA 24060 (US). PHILIPS, Janice, Paige [US/US]; 2539 Twelve O'Clock Knob Road, Salem, VA 24153 (US). KOENE, Bryan [US/US]; 1835 Augusta National Road, Blacksburg, VA 24060 (US).

- (74) Agent: DAVIDSON, Bryan, H.; Nixon & Vanderhye, P.C., Suite 800, 1100 North Glebe Road, Arlington, VA 22201-4714 (US).
- (81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SM, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.
- (84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM),

[Continued on next page]

(54) Title: PROCESS AND SYSTEMS FOR THE EFFICIENT PRODUCTION OF POLYMERIC MICROSPHERES



(57) Abstract: Processes and systems are provided whereby continuous polymeric microspheres are made by nebulizing a solventless initiated monomeric liquid (18) (that is a liquid solution comprising a monomer and a polymerization initiator for the monomer) to form an aerosol of polymerization-initiated monomeric liquid droplets (14) within a gas-filled reaction zone (12). The nebulized droplets of the monomeric liquid are allowed to fall under gravitational force through the reaction zone and to polymerize therewithin. The thus polymerized particles may thereafter be collected and removed from the reaction zone for further processing and/or use as may be desired.



European (AT. BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

Published:

with international search report